

UBC Sustainability Scholars Program 2019

The UBC Sustainability Initiative (USI) is pleased to offer current UBC graduate students the opportunity to work on funded sustainability internship projects. Successful candidates work under the mentorship of a partner organization, and are immersed in real world learning where they can apply their research skills and contribute to advancing organizational sustainability goals.

For more information about the Sustainability Scholars Program and to apply to work on this project, please visit the [Student Opportunities](#) page.

Please review the application guide (PDF) before applying.

Application closes **midnight Sunday March 24, 2019.**

Research project title

Building energy performance modelling using a net-zero approach

Sustainability Goal or Operations Plan objective

Climate Leadership

Long Term Goal: Develop a new forward-looking site-specific reference house approach that could be considered for use with future National Building Code net-zero ready performance targets. This approach will create cohesion rather than conflicts between energy and climate adaptation or other priority considerations for building design.

Outline scope of project and why it is of value to your organization. Describe how and when the Scholar's work will be actionable.

Evaluate the feasibility of implementing a new forward-looking site-specific net-zero reference house approach.

- With the current reference house approach, energy modelling is used to compare the expected performance of the proposed building with a reference building modelled to the minimum code levels (e.g. 9.36 prescriptive requirements), or a previously established baseline (e.g. ASHRAE 90.1 – 2007). The current approach has some limitations:
 - Energy Reduction targets may need to be revisited when the baseline code is updated.
 - The reference building typically has the same architecture as the modelled building (with the exception of window distribution and potentially window-to-wall ratio), and hence may fail to incent more energy efficient architecture and building form.
 - In some cases, the mechanical systems of the reference building would change with the proposed design, resulting in a shift in the energy target.
- In the proposed forward-looking site-specific net-zero approach, the reference building would be modelled to the net-zero ready standard, taking into consideration site constraints and climate resilience needs:
 - The reference building would be modelled using an optimal architectural form with minimal thermal bridging, so less efficient building forms and construction details would invite an energy penalty.
 - The reference building would be modelled using low-carbon HVAC equipment that would be independent of the equipment choice of the proposed design.

- The given constraints of a building site would be modelled similarly in both the reference and proposed design (e.g. lot size, orientation, topography, solar access, shading from adjacent structures, etc.)
- Site-specific climate and hazard resilience considerations would be modelled similarly in both the reference and proposed design (e.g. fire-smart and windproof design that may limit the use of overhangs in some locations)
- This approach can be further enhanced to incorporate other objectives such as reducing embodied carbon and minimizing construction wastes.

The Sustainability Scholar will first refine the exact rules/approach that would be used in defining the reference building. Once the approach has been established, the approach will be tested against the data that was created for Energy Step Code Metrics Research Project.

Deliverables

- A final report, containing a summary of completed work with recommendations, complemented by a final presentation to key stakeholders.
- A detailed description of any additional research and analysis that would be required before implementing the new proposed reference building approach.
- A final report [or Executive Summary] for the UBC Sustainability Scholars online project library.

Time Commitment

- This project will take **250*** hours to complete.
- This project must be completed between April 29 and August 12
- The Scholar is to complete hours between 8:30am and 4:30pm, Monday to Friday, approximately 12 to 20 hours per week.
- Any mandatory meetings, special events, etc. will be scheduled to ensure that the Scholar will be available

Required/preferred Skills and Background

- Excellent research and writing skills
- Demonstrated interest in sustainability
- Strong analytical skills
- Ability to work independently
- Project management and organizational skills
- Demonstrated experience in Building energy modelling
- Familiarity preparing feasibility studies

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Apply here:

<https://sustain.ubc.ca/student-opportunities>

Be sure to read the application guidelines to confirm your eligibility to participate in the program here:

<https://sustain.ubc.ca/student-opportunities>

Contact Karen Taylor at sustainability.scholars@ubc.ca if you have questions.